THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A lattice pin for joining lattice sections to form a lattice, said pin including:

a mid-section having a first shoulder for abutting an outer surface of a first lattice section, and a second shoulder for abutting an outer surface of a second lattice section to which the said first lattice section is to be joined;

a first pin section extending outwardly from the mid-section, and including a taper which defines a burst end for bursting through the lattice section;

a second pin section extending outwardly from the mid-section in a direction opposite the first pin section, and having a taper for defining a second burst end for bursting through the second lattice section; and

wherein the bursting of the pin sections through the lattice sections couples the lattice pin to the sections and therefore, in turn, couples the lattice sections together, with the first and second shoulders abutting the lattice sections respectively to separate the lattice sections and allow movement of the lattice sections with respect to one another.

2. The pin of claim 1 wherein each taper includes a first tapered portion having a first taper, and a second tapered portion arranged between the first taper and the respective shoulder of the mid-section, the second tapered portion having a second taper which is more gradual than the first taper.

3. The pin of claim 2 wherein the second tapered portion includes serrations for facilitating gripping of the second tapered portion to the lattice when the pin sections burst through the lattice sections.

4. The pin of claim 1 wherein the mid-section is

cylindrical and the shoulders are formed by end surfaces of the cylindrical mid-section, arranged diametrically outwardly of the pin sections.

5. A lattice including:

a plurality of lattice sections extending in a first direction;

a plurality of overlapping lattice sections extending in a direction transverse to the first direction; and

a plurality of lattice pins, as described above, interconnecting the lattice sections at locations where the lattice sections overlap one another.

6. The lattice of claim 5 wherein the first lattice sections are arranged substantially vertically having regard to the orientation in which the lattice is to be installed, and the second lattice sections are arranged substantially horizontally.

7. The lattice of claim 5 wherein the first lattice sections are arranged at an angle of about 45° to the horizontal, having regard to the orientation in which the lattice is to be installed, and the second lattice sections are arranged perpendicular to the first lattice sections.

8. A lattice forming machine including:

indexing means for indexing the lattice section relative to a pin insertion station;

lattice pin feeding means for feeding lattice pins to the pin insertion station; and

pin insertion means at the station for sequentially engaging said pins so that, when the lattice section is indexed by the indexing means relative to the station, the pin insertion means forces the pins into the lattice section so that the pins burst through the lattice

section to thereby provide a lattice section, from which a lattice can be formed, in which a plurality of lattice pins are inserted.

9. The machine of claim 8 wherein the indexing means comprises an indexing cylinder and extendible and retractable ram arm, clamping means on the ram arm for clamping the lattice section, so that when the ram arm is extended, the lattice section is moved with the ram arm, and when the clamp is released, the ram arm and clamp can be retracted relative to the lattice section to then again clamp the lattice section and index the lattice section upon repeated extension of the ram arm.

10. The machine of claim 9 wherein the clamp comprises a clamp housing through which the lattice section passes, a clamp cylinder and clamp ram arm carried on the ram arm of the indexing cylinder, and whereupon extension of the clamp cylinder ram arm causes the lattice to be clamped between the clamp cylinder ram arm and a portion of the housing so that upon extension of the indexing cylinder ram arm, the lattice section is carried with the clamp housing to thereby index the lattice section.

11. The machine of claim 8 wherein the pin feeding means comprises:

a drum for containing a plurality of pins;

a guide chute having one end located in the drum for receiving pins for guiding movement of the pins to a second end of the chute;

a moveable feeder for receiving pins from the chute and for moving the pins to the insertion station; and

a press head for engaging the pins at the insertion station and for forcing the pins into the lattice section.

12. The machine of claim 11 wherein the press head is carried by a ram arm of a pneumatic press cylinder, so that upon extension of the ram arm, the press head engages the pin and presses the pin into the lattice section so that the pin bursts through the lattice section.

13. The machine of claim 11 wherein the feeder comprises a rotary feed plate having a plurality of recesses for receiving pins from the chute and orienting the pins for insertion into the lattice section.

14. The machine of claim 11 including feeder moving means for moving the feeder relative to the pin so as to disengage the pin from the feeder after engagement by the press so that the pin can be pressed into the lattice section without interference from the feeder.

15. The machine of claim 13 wherein the feed plate includes a plurality of recesses, each for receiving a pin, and indexing means for indexing the feeder plate so as to present pins at the insertion station for engagement by the press upon each indexing of the lattice section relative to the insertion station.

16. The machine of claim 15 wherein the feed plate indexing means comprises an indexing plate coupled for rotation with the feeder plate, the indexing plate having a plurality of ratchet portions, and a pawl mechanism for engaging the ratchet portions and causing rotation of the ratchet plate to thereby index the ratchet plate and the feeder plate to bring the pins held by the feeder plate sequentially to the insertion station.

17. The machine of claim 16 wherein the pawl comprises an indexing cylinder and ram arm for engaging the ratchets of the ratchet plate, and biasing means for

biasing the ram arm into engagement with the ratchet plate.

18. A feeding apparatus for feeding a work piece to a work station, including:

support means for supporting a plurality of said articles, one above another;

moving means for moving a lowermost one of the articles out of the stack of articles; and

feeding means for feeding the moved article to a work station.

19. The apparatus of claim 18 wherein the support means comprises a support structure inclined with respect to the vertical, so the stacked articles can rest in a stacked configuration against the support member.

20. The apparatus of claim 18 wherein the moving means comprises:

at least one pivotally mounted abutment member; and

a ram coupled to the abutment member for pivoting the abutment member from a retracted position to an extended position so that during movement of the abutment member between the retracted position and extended position, the abutment member engages the lowermost article and pushes the article sideways with respect to the stack of articles.

21. The apparatus of claim 18 wherein the feeding means comprises a ram for pushing the article in a direction transverse to the sideways movement of the article.

22. An unloading rack for receiving elongate work pieces, including:

a support member for receiving one of the

elongate members;

an inclined guide section extending from the support section;

a stop at a lower portion of the inclined guide section; and

driving means for moving the elongate member off the support section and on to the inclined section so that the work piece slides down the inclined section towards the stop.

23. The rack of claim 22 wherein the drive means comprises at least one ejection nozzle for ejection of air to blow the work piece off the support section and on to the inclined section.

24. An apparatus for assembling a lattice, including:

a support section for supporting a plurality of first lattice sections which extend in a first direction and a plurality of overlapping second lattice sections which extend in a direction transverse to the first direction, the first lattice sections each having a plurality of pins, each pin having a first pin section penetrating one of the first lattice sections, and a second pin section adjacent one of the second lattice sections; and

a roller assembly having a plurality of roller pairs, each roller pair having two rollers separated by a different distance which decreases from a feed end to an exit end of the roller assembly, for receiving the first plurality and second plurality of lattice sections, and for pressing the lattice sections together so as to cause the second pin sections to penetrate into the second plurality of lattice sections to thereby couple the first and second lattice sections together to form the lattice.

25. The apparatus of claim 24 wherein the plurality of roller pairs comprise a first roller pair at the feed

end of the roller assembly, a second roller pair at the exit end of the roller assembly, and at least one intermediate roller pair between the first and second roller pairs, the distance between the rollers in each roller pair decreasing from the first roller pair at the feed end to the second roller pair at the exit end of the roller assembly.

26. The apparatus of claim 25 wherein each roller pair comprises a first upper roller and a second lower roller, drive means for driving one of the rollers in each roller pair so as to draw the lattice sections through the roller assembly so the lattice sections are pressed together to cause the second pin sections to penetrate the second lattice sections.

27. The apparatus of claim 24 wherein the drive means comprises a motor and drive belt arrangement.

28. The apparatus of claim 26 wherein an upper roller in each roller pair is coupled to position adjusting means for adjusting the position of the upper roller relative to the lower roller in each roller pair, to thereby set the distance between the rollers in each roller pair.

29. An apparatus for forming a lattice from a plurality of first lattice sections, a plurality of second lattice sections, and pins having a first pin portion and a second pin portion which extends in a direction opposite the first pin portion including:

pin inserting means for inserting the pins into each of the first lattice sections so that the first pin portions burst through the lattice section and penetrate into the lattice section;

a support platform for supporting a plurality of the said first lattice sections with the pins, and a plurality of overlapping said second lattice sections

extending in a direction transverse to the first lattice sections and being adjacent the second pin portions of the pins; and

a roller assembly having at least one pair of rollers for concurrently receiving the first lattice sections and the second lattice sections and pressing the second lattice sections towards the first lattice sections so the second pin portions penetrate the second lattice sections to thereby couple the first lattice sections to the second lattice sections.

30. The apparatus of claim 29 wherein the roller assembly includes a plurality of roller pairs, the plurality of roller pairs including a first entry roller pair and a second exit roller pair, the distance between the two rollers forming each roller pair decreasing from the first roller pair to the second roller pair, so as to progressively press the plurality of first lattice sections towards the plurality of second lattice sections, so that the second pin portion progressively penetrates into the second lattice sections to thereby couple the second lattice sections to the first lattice sections.

31. The apparatus of claim 30 wherein at least two intermediate roller pairs are arranged between the first roller pair and the second roller pair.

32. The apparatus of claim 29 wherein the support platform includes a plurality of support guides for supporting the first lattice sections in a folded configuration and for supporting the second lattice sections also in a folded configuration, so that when the first and second lattice pairs are concurrently fed through the roller assembly, the lattice is formed in a folded configuration and, after exit from the roller assembly, can be opened into a deployed configuration.

33. The apparatus of claim 32 wherein the support platform comprises a jig having a lower platen, the support guides comprising locater pins extending upwardly from the lower platen, so that the first lattice sections and second lattice sections can be located between sets of the locater pins in the folded configuration, a top platen having a plurality of bores for registering with the locater pins and for enabling the top platen to move downwardly towards the lower platen when the jig moves through the roller assembly, whereby pressed the first lattice sections and second lattice sections together.

34. The apparatus of claim 29 including a cutting station for cutting the first and/or second lattice sections to a predetermined length to suit the size of the lattice to be produced by the apparatus.

35. The apparatus of claim 29 including a feeding mechanism having support means for supporting a plurality of first lattice sections in a stack one above another, moving means for moving a lowermost one of the first lattice sections out of the stack of lattice sections, and feeding means for feeding the moved section to the pin insertion means.

36. The apparatus of claim 35 wherein the support means comprises a support structure inclined with respect to the vertical, so the stacked articles can rest in a stacked configuration against the support member.

37. The apparatus of claim 35 wherein the moving means comprises:

at least one pivotally mounted abutment member; and

a ram coupled to the abutment member for pivoting the abutment member from a retracted position to an extended position so that during movement of the abutment

member between the retracted position and extended position, the abutment member engages the lowermost article and pushes the article sideways with respect to the stack of articles.

38. The apparatus of claim 29 further including an unloading table for receiving first lattice sections having pins from the pin inserting means, the loading table having a support member for receiving one of the elongate members, an inclined guide section extending from the support section, a stop at a lower portion of the inclined guide section, and driving means for moving the elongate member off the support section and onto the inclined section so that the lattice section slides down the inclined section towards the stop.

39. The apparatus of claim 28 wherein the driving means comprises at least one ejection nozzle for ejection of air to blow the lattice section off the support section and onto the inclined section.

40. An apparatus for forming a lattice, including:

a roller assembly having a plurality of roller pairs which comprise an entry roller pair, an exit roller pair, and at least one intermediate roller pair, the rollers in each roller pair being separated by a distance which gradually decreases from the entry roller pair to the exit roller pair, so that when a lattice assembly formed of a plurality of first lattice sections, and a plurality of second lattice sections overlapping the first lattice sections, and pins between the first and second lattice sections, is passed through the roller assembly, the first lattice sections are progressively pressed towards the second lattice sections as the lattice assembly passes through each roller pair, so as to progressively cause the pins the penetrate into at least the second lattice sections to therefore join the lattice

sections together and form the lattice.

41. The apparatus of claim 40 wherein the first lattice sections are provided with the pins which penetrate and embed into the first lattice sections prior to delivery of the lattice assembly to the roller assembly, so that when the first and second lattice sections are progressively pressed together, the pin then penetrates into the second lattice sections to join the first and second lattice sections together.

42. A method of forming a lattice section from which a lattice is to be made, including the steps of:

indexing the lattice section relative to a pin insertion station;

feeding the pins to the pin insertion station; and

forcing the pins into the lattice section along the length of the lattice section so that the pins burst through the lattice section and embed in the lattice section.

43. A method of manufacturing a lattice including the steps of:

supporting a plurality of first lattice sections and a plurality of second lattice sections in overlapping configuration, the first lattice sections being provided with embedded pins, and each pin having a pin portion extending out of the lattice in which the pin is embedded and being arranged adjacent the second lattice sections;

concurrently passing the assembled first and second lattice sections through a roller assembly having a plurality of roller pairs, with the rollers in each roller pair being separated by a distance which decreases from a feed end of the roller assembly to an exit end of the roller assembly, so that the first and second lattice sections are pressed together as the lattice sections pass

through the roller assembly, to cause the pin portions to penetrate the second lattice sections by bursting through the second lattice sections to thereby couple the first and second lattice sections together and form the lattice.

44. A method for forming a lattice from a plurality of first lattice sections, a plurality of second lattice sections and pins having a first pin portion, and a second pin portion which extends in a direction opposite the first pin portion, including the steps of:

indexing the first lattice sections past a pin insertion station and, at the pin insertion station, pressing a plurality of pins into each first lattice section so that the first pin portion bursts through the first lattice section and embeds in the first lattice section;

assembling the lattice by arranging the first lattice sections and second lattice sections in overlapping configuration, with the second lattice sections being adjacent the second pin portions; and

concurrently feeding the first and second lattice sections through a pressing station so that the first lattice sections are pressed towards the second lattice sections so that the second pin portions burst through and embed in the second lattice sections to thereby join the first and second lattice sections together to form the lattice.

45. The method of claim 44 wherein the step of pressing the first and second lattice sections comprises the step of passing the assembled lattice sections through a roller assembly, having a plurality of rollers so that the first and second lattice sections are progressively pressed towards one another so that the second pin portions progressively penetrate into the second lattice portions.

46. A method of forming a lattice from a lattice assembly which comprises a plurality of first lattice sections, a plurality of second lattice sections which overlap the first lattice sections, and pins disposed between the first and second lattice sections, said method comprising progressively pressing the first lattice sections towards the second lattice sections so that the pins progressively burst through and embed in the second lattice sections to join the first and lattice sections together.

47. The method of claim 46 wherein the method comprises pressing the lattice sections together by passing the lattice assembly through a plurality of roller pairs, in which the rollers of each roller pair are separated by a distance which decreases from an entry roller pair to an exit roller pair.

48. The method of claim 47 wherein the method also includes, prior to passing the lattice assembly through the press, embedding the pins into the first lattice sections to that the pins embed in those lattice sections and extend out of the lattice sections for embedding in the second lattice sections upon pressing of the lattice sections together.

49. A jig for supporting a lattice assembly for passing through a roller assembly to form a lattice from the lattice assembly, the jig including:

a lower platen having a plurality of upstanding locater pins, the locater pins defining channels in which a plurality of first lattice sections and a plurality of second lattice sections can be located in overlapping configuration, one of the first or second plurality of lattice sections having inbedded pins which project out of the lattice section, and the other of the lattice sections being arranged adjacent the inbedded pins;

a top platen having a plurality of bores which register with the locater pins so that the top platen can be located on the locater pins for sandwiching the first and second lattice sections between the top platen and the bottom platen; and

wherein when pressure is applied to the top platen, the top platen is pushed towards the bottom platen to, in turn push the first and second plurality of lattice sections together so that the inbedded pin penetrates the other of the first or second lattice sections to thereby secure the first and second lattice sections together to form the lattice.

50. The jig according to claim 49 wherein an ejection plate is located above the lower platen for supporting the lattice assembly, and air supply means for supplying compressed air beneath the ejector plate so the ejector plate is lifted after removal of the top platen to facilitate removal of the formed lattice from the locater pins.

51. The jig of claim 50 wherein the compressed air supply means includes a hand operated valve for supplying the air to beneath the ejector plate.

52. The jig according to claim 51 wherein at least one tube is located between the lower platen and the ejector plate, the tube having a plurality of outlet holes and the supply of compressed air being connected to the tube so the compressed air is supplied through the tube to the ejector plate